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NOTES AND EXTRACTS.

SUN SPOTS AND THE WEATHER CONDITIONS ON THE EARTH.

In a recent interview Professor Bigelow said:

The connection between the outbreak of sun spots and the weather conditions on the earth has been discussed for many years with very different conclusions. A certain class of students contends that there is a distinct connection between the weather conditions and the number of sun spots from year to year, while others maintain that such connection is really insignificant.

The fact is that the direct comparison of the weather with the sun spots does not do justice to the scientific side of the problem, because the sun exhibits an outflow of energy in other ways than by the number of visible sun spots. Such other ways are the prominences or hydrogen flames, the number of faculæ, the extent of the corona, and the variation of the earth's magnetic field, as shown in the aurora and in the movements of the magnetic needles in the different parts of the earth.

The sun spots are a comparatively sluggish or insufficient register of the effect of the sun's internal action, especially as compared with the prominences or the magnetic field. Oftentimes there are sun spots without corresponding weather phenomena, or there may be active weather conditions without spots, but taking the statistics broadly from year to year it has been proved conclusively that the variation of the activity of the sun, as shown in its prominences or in the earth's magnetic field, does have a corresponding change in the variation of the annual temperatures and pressures in all parts of the earth.

The problem becomes very complicated for the meteorologist because the change in the sun's action first stirs up the circulation of the whole atmosphere of the earth, and this in its turn produces storms more or less vigorous in different parts of the earth; so that the occurrence of a storm at any given place must be referred back to the sun's action more or less indirectly through a long chain of circumstances. These are at present only partially understood, but rapid progress is being made in the examination and classification of the facts. We are looking now to a study of prominences and the magnetic field as promising more direct and valuable information regarding weather conditions than the sun spots. It is like trying to find the most sensitive pulse in a circulating system.

WEATHER BUREAU MEN AS INSTRUCTORS.

According to the News, Macon, Ga., October 22—

There are not less than thirty schools in and around Macon which are using the weather reports as charts for instruction. The teachers say that there is nothing which is so helpful in teaching physical geography as the information and the maps that are furnished by the Bureau. Ample opportunity is given the little ones to study the movement of the clouds, the variations in temperature, and the changing and shifting of the elements in a way that impresses the young mind and affords a practical illustration in fact to the truths that have been taught in theory.

Frequently classes from the city school system pay Mr. Weeks a visit for the purpose of examining more closely into his methods and instruments used in making his forecasts.

Mr. Edward A. Beals, District Forecaster, Portland, Oreg., reports that the second section of the high school class in physical geography visited the local office of the Weather Bureau on October 19 and was instructed by Assistant Observer John Grover.

It is announced that on December 18, Mr. Weston M. Fulton, Local Forecaster, Knoxville, Tenn., will deliver a public lecture on meteorological subjects at Chattanooga. At the close of the lecture a collection will be taken up to raise funds for the meteorological department of the high school.

As many high schools and other institutions in the country have been disappointed on finding that the Weather Bureau has no authority to loan or give apparatus for educational purposes, we commend to them this new method of raising funds needed to purchase the meteorological equipment.

Mr. Charles Stewart, Observer of the Weather Bureau, reports a lecture delivered by himself before the Spokane Science Club November 10. This was one of numerous lectures under the general title of "Weather Changes and their Causes," that he has delivered to various audiences; sometimes to the pupils of a primary grade school, sometimes to the advance pupils of a high school, and at other times to the general public.

In the present case Mr. Stewart reports that he began with some remarks on the composition of the atmosphere; then a Weather Bureau barometer was exhibited and the principle underlying the action of the barometer was considered. The prevailing upper westerly winds were cited as the cause of the easterly drift of the weather changes in our latitudes; a chart of an ideal cyclone was exhibited and the characteristics of pressure, winds, temperature, cloud and rain area, etc., within a cyclone noted; then the characteristics of the cyclone were considered in detail, involving some consideration of the cyclone as of convectional origin, and some of the properties of a gas when expanding or being compressed; the theory of cyclones was demonstrated by blackboard diagrams, together with diagrams relating to tornadoes. After the foregoing preliminaries, a large map of the United States was exhibited, and on this map the climatological divisions of the United States were noted and the average routes of cyclones traced. Then the course of an imaginary cyclone was traced from the Pacific to the Atlantic, and the resulting weather changes, as modified by topography, were pointed out; this involved a notice of warm waves, chinooks, cold waves, and tornadoes. The cause of the limitation of tornadoes to the eastern portion of the country was also considered and forecasting was touched upon.

Mr. L. M. Pindell, Observer Weather Bureau, Chattanooga, Tenn., reports an afternoon devoted to the local high school class in meteorology on October 9.

Prof. Alexander G. McAdie reports that on October 19, forty pupils of the Adams Cosmopolitan School of San Francisco visited the Weather Bureau office of that city and spent about one hour, receiving the usual instruction and explanations relative to Weather Bureau work.